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SEQUENCE LISTING

<110> TAKASHITA, Ryo
YASUEDA, Hisashi
GUNJI, Yoshiya

<120> METHOD FOR PRODUCING ALCOHOL BY USING MICROORGANISM

<130>

<150> JP 2001-270903

<151> 2001-09-06

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<170> PatentIn Ver. 2.0

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<213> Artificial Sequence

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<223> Description of Artificial Sequence:primer

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gcgcagagcg gcggggaggc gtccgccagc tcgtcgatca ggctcaggag ttcggttttg 720
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Met

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Thr Lys Ala Ala Thr Asp Ala Leu Ala Ala Asn Arg Ala Pro Thr Ser

gtg aat gca cag gaa gtg cac cgt tgg ctc cag agc ttc aac tgg gat 1591
Val Asn Ala Gln Glu Val His Arg Trp Leu Gln Ser Phe Asn Trp Asp

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Phe Lys Asn Asn Arg Thr Lys Tyr Ala Thr Lys Tyr Lys Met Ala Asn

gag acc aag gaa cag ttc aag ctg atc gcc aag gaa tat gcg cgc atg 1687
Glu Thr Lys Glu Gln Phe Lys Leu Ile Ala Lys Glu Tyr Ala Arg Met

gag gca gtc aag gac gaa agg cag ttc ggt agc ctg cag gat gcg ctg 1735
Glu Ala Val Lys Asp Glu Arg Gln Phe Gly Ser Leu Gln Asp Ala Leu

acc cgc ctc aac gcc ggt gtt cgc gtt cat ccg aag tgg aac gag acc 1783
Thr Arg Leu Asn Ala Gly Val Arg Val His Pro Lys Trp Asn Glu Thr

90 95 100
 atg aaa gtg gtt tcg aac ttc ctg gaa gtg ggc gaa tac aac gcc atc 1831
 Met Lys Val Val Ser Asn Phe Leu Glu Val Gly Glu Tyr Asn Ala Ile

105 110 115 1879
gcc gct acc ggg atg ctg tgg gat tcc gcc cag gcg gcg gaa cag aag
Ala Ala Thr Gly Met Leu Trp Asp Ser Ala Gln Ala Ala Glu Gln Lys

120 125 130 1927

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Asn Gly Tyr Leu Ala Gln Val Leu Asp Glu Ile Arg His Thr His Gln

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tgt gcc tac gtc aac tac tac ttc gcg aag aac ggc cag gac ccg gcc 1975
Cys Ala Tyr Val Asn Tyr Tyr Phe Ala Lys Asn Gly Gln Asp Pro Ala

155 160 165
 ggt cac aac gat gct cgc cgc acc cgt acc atc ggt ccg ctg tgg aag 2023
 Gly His Asn Asp Ala Arg Arg Thr Arg Thr Ile Gly Pro Leu Trp Lys

gag atg aag cgc gtg ttt tcc gag ggc ttc att tcc ggc gac gcc gtg 2071
Gly Met Lys Arg Val Phe Ser Asp Gly Phe Ile Ser Gly Asp Ala Val

gaa tgc tcc ctc aac ctg cag ctg gtg ggt gag gcc tgc ttc acc aat 2119
Glu Cys Ser Leu Asn Leu Gln Leu Val Gly Glu Ala Cys Phe Thr Asn

200 205 210 2167
ccg ctg atc gtc gca gtg acc gaa tgg gct gcc gcc aac ggc gat gaa
Pro Leu Ile Val Ala Val Thr Glu Trp Ala Ala Ala Asn Gly Asp Glu

215 220 225 230
atc acc ccg acg gtg ttc ctg tcg atc gag acc gac gaa ctg cgc cac 2215
Ile Thr Pro Thr Val Phe Leu Ser Ile Glu Thr Asp Glu Leu Arg His

atg gcc aac ggt tac cag acc gtc gtt tcc atc gcc aac gat ccg gct 2263
Met Ala Asn Gly Tyr Gln Thr Val Val Ser Ile Ala Asn Asp Pro Ala

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Ser	Ala	Lys	Tyr	Leu	Asn	Thr	Asp	Leu	Asn	Asn	Ala	Phe	Trp	Thr	Gln	
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cag	aag	tac	ttc	acg	ccg	gtg	ttg	ggc	atg	ctg	ttc	gag	tat	ggc	tcc	2359
Gln	Lys	Tyr	Phe	Thr	Pro	Val	Leu	Gly	Met	Leu	Phe	Glu	Tyr	Gly	Ser	
	280					285					290					
aag	ttc	aag	gtc	gag	ccg	ttg	gtc	aag	acg	tgg	gac	cgc	tgg	gtg	tac	2407
Lys	Phe	Lys	Val	Glu	Pro	Trp	Val	Lys	Thr	Trp	Asp	Arg	Trp	Val	Tyr	
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gag	gac	tgg	ggc	ggc	atc	tgg	atc	ggc	cgt	ctg	ggc	aag	tac	ggg	gtg	2455
Glu	Asp	Trp	Gly	Gly	Ile	Trp	Ile	Gly	Arg	Leu	Gly	Lys	Tyr	Gly	Val	
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Glu	Ser	Pro	Arg	Ser	Leu	Lys	Asp	Ala	Lys	Gln	Asp	Ala	Tyr	Trp	Ala	
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His	His	Asp	Leu	Tyr	Leu	Leu	Ala	Tyr	Ala	Leu	Trp	Pro	Thr	Gly	Phe	
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ttc	cgt	ctg	gcg	ctg	ccg	gat	cag	gaa	gaa	atg	gag	tgg	ttc	gag	gcc	2599
Phe	Arg	Leu	Ala	Leu	Pro	Asp	Gln	Glu	Glu	Met	Glu	Trp	Phe	Glu	Ala	
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cgc	gcc	cgc	ggt	tgc	gag	gat	ccg	tcc	tcg	ggc	ttc	atc	ccg	ctg	atg	2695
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tgg	ttc	atc	gaa	aac	aac	cat	ccc	atc	tac	atc	gat	cgc	gtg	tcg	caa	2743
Trp	Phe	Ile	Glu	Asn	Asn	His	Pro	Ile	Tyr	Ile	Asp	Arg	Val	Ser	Gln	
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gtg	ccg	ttc	tgc	ccg	agc	ttg	gcc	aag	ggc	gcc	agc	acc	ctg	cgc	gtg	2791
Val	Pro	Phe	Cys	Pro	Ser	Leu	Ala	Lys	Gly	Ala	Ser	Thr	Leu	Arg	Val	
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His	Glu	Tyr	Asn	Gly	Glu	Met	His	Thr	Phe	Ser	Asp	Gln	Trp	Gly	Glu	
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cgc	atg	tgg	ctg	gcc	gag	ccg	gag	cgc	tac	gag	tgc	cag	aac	atc	ttc	2887
Arg	Met	Trp	Leu	Ala	Glu	Pro	Glu	Arg	Tyr	Glu	Cys	Gln	Asn	Ile	Phe	
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gaa	cag	tac	gaa	gga	cgc	gaa	ctg	tcg	gaa	gtg	atc	gcc	gaa	ctg	cac	2935
Glu	Gln	Tyr	Glu	Gly	Arg	Glu	Leu	Ser	Glu	Val	Ile	Ala	Glu	Leu	His	
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Gly	Leu	Arg	Ser	Asp	Gly	Lys	Thr	Leu	Ile	Ala	Gln	Pro	His	Val	Arg	
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Gly	Asp	Lys	Leu	Trp	Thr	Leu	Asp	Asp	Ile	Lys	Arg	Leu	Asn	Cys	Val	
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ttc	aag	aac	ccg	gtg	aag	gca	ttc	aat	tga	aacgggtgtc	gggctccgtc					3081
Phe	Lys	Asn	Pro	Val	Lys	Ala	Phe	Asn								
	520					525										
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atg	agc	atg	tta	gga	gaa	aga	cgc	cgc	ggc	ctg	acc	gat	ccg	gaa	atg	3189
Met	Ser	Met	Leu	Gly	Glu	Arg	Arg	Arg	Gly	Leu	Thr	Asp	Pro	Glu	Met	

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gcg gcc gtc att ttg aag gcg ctt cct gaa gct ccg ctg gac ggc aac				3237
Ala Ala Val Ile Leu Lys Ala Leu Pro Glu Ala Pro Leu Asp Gly Asn				
aac aag atg ggt tat ttc gtc acc ccc cgc tgg aaa cgc ttg acg gaa				3285
Asn Lys Met Gly Tyr Phe Val Thr Pro Arg Trp Lys Arg Leu Thr Glu				
tat gaa gcc ctg acc gtt tat gcg cag ccc aac gcc gac tgg atc gcc				3333
Tyr Glu Ala Leu Thr Val Tyr Ala Gln Pro Asn Ala Asp Trp Ile Ala				
ggc ggc ctg gac tgg ggc gac tgg acc cag aaa ttc cac ggc ggc cgc				3381
Gly Gly Leu Asp Trp Gly Asp Trp Thr Gln Lys Phe His Gly Gly Arg				
cct tcc tgg ggc aac gag acc acg gag ctg cgc acc gtc gac tgg ttc				3429
Pro Ser Trp Gly Asn Glu Thr Thr Glu Leu Arg Thr Val Asp Trp Phe				
aag cac cgt gac ccg ctc cgc cgt tgg cat gcg ccg tac gtc aag gac				3477
Lys His Arg Asp Pro Leu Arg Arg Trp His Ala Pro Tyr Val Lys Asp				
aag gcc gag gaa tgg cgc tac acc gag cgc ttc ctg cag ggt tac tcc				3525
Lys Ala Glu Trp Arg Tyr Thr Asp Arg Phe Leu Gln Gly Tyr Ser				
gcc gac ggt cag atc cgg gcg atg aac ccg acc tgg cgg gac gag ttc				3573
Ala Asp Gly Gln Ile Arg Ala Met Asn Pro Thr Trp Arg Asp Glu Phe				
atc aac cgg tat tgg ggc gcc ttc ctg ttc aac gaa tac gga ttg ttc				3621
Ile Asn Arg Tyr Trp Gly Ala Phe Leu Phe Asn Glu Tyr Gly Leu Phe				
aac gct cat tcg cag ggc gcc cgg gag gcg ctg tcg gac gta acc cgc				3669
Asn Ala His Ser Gln Gly Ala Arg Glu Ala Leu Ser Asp Val Thr Arg				
gtc agc ctg gct ttc tgg ggc ttc gac aag atc gac atc gcc cag atg				3717
Val Ser Leu Ala Phe Trp Gly Phe Asp Lys Ile Asp Ile Ala Gln Met				
atc caa ctc gaa cgg ggt ttc ctc gcc aag atc gta ccc ggt ttc gac				3765
Ile Gln Leu Glu Arg Gly Phe Leu Ala Lys Ile Val Pro Gly Phe Asp				
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Glu Ser Thr Ala Val Pro Lys Ala Glu Trp Thr Asn Gly Glu Val Tyr				
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Lys Ser Ala Arg Leu Ala Val Glu Gly Leu Trp Gln Glu Val Phe Asp				
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Trp Asn Glu Ser Ala Phe Ser Val His Ala Val Tyr Asp Ala Leu Phe				
ggt cag ttc gtc cgc cgc gag ttc ttt cag cgg ctg gct ccc cgc ttc				3957
Gly Gln Phe Val Arg Arg Glu Phe Phe Gln Arg Leu Ala Pro Arg Phe				
ggc gac aat ctg acg cca ttc ttc atc aac cag gcc cag tac ttc				4005
Gly Asp Asn Leu Thr Pro Phe Phe Ile Asn Gln Ala Gln Thr Tyr Phe				
cag atc gcc aag cag ggc gta cag gat ctg tat tac aac tgt ctg ggt				4053
Gln Ile Ala Lys Gln Gly Val Gln Asp Leu Tyr Tyr Asn Cys Leu Gly				

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Thr	Gly	Lys	Trp	Leu	Glu	Pro	Thr	Ile	Ala	Ala	Leu	Arg	Asp	Phe	Met	
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ggg	ctg	ttt	gcg	aag	ctg	ccg	gcg	ggc	acc	act	gac	aag	gaa	gaa	atc	4197
Gly	Leu	Phe	Ala	Lys	Leu	Pro	Ala	Gly	Thr	Thr	Asp	Lys	Glu	Glu	Ile	
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acc	gcg	tcc	ctg	tac	cgg	gtg	gtc	gac	gac	tgg	atc	gag	gac	tac	gcc	4245
Thr	Ala	Ser	Leu	Tyr	Arg	Val	Val	Asp	Asp	Trp	Ile	Glu	Asp	Tyr	Ala	
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agc	gcg	atc	gac	ttc	aag	gcg	gac	cgc	gat	cag	atc	gtt	aaa	gcg	gtt	4293
Ser	Ala	Ile	Asp	Phe	Lys	Ala	Asp	Arg	Asp	Gln	Ile	Val	Lys	Ala	Val	
	370				375						380					
ctg	gca	gga	ttg	aaa	taa	tagaggaact	attacg	atg	agc	gta	aac	agc	aac			4345
Leu	Ala	Gly	Leu	Lys				Met	Ser	Val	Asn	Ser	Asn			
385								1				5				
gca	tac	gac	gcc	ggc	atc	atg	ggc	ctg	aaa	ggc	aag	gac	ttc	gcc	gat	4393
Ala	Tyr	Asp	Ala	Gly	Ile	Met	Gly	Leu	Lys	Gly	Lys	Asp	Phe	Ala	Asp	
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cag	ttc	ttt	gcc	gac	gaa	aac	caa	gtg	gtc	cat	gaa	agc	gac	acg	gtc	4441
Gln	Phe	Phe	Ala	Asp	Glu	Asn	Gln	Val	Val	His	Glu	Ser	Asp	Thr	Val	
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gtt	ctg	gtc	ctc	aag	aag	tcg	gac	gag	atc	aat	acc	ttt	atc	gag	gag	4489
Val	Leu	Val	Leu	Lys	Lys	Ser	Asp	Glu	Ile	Asn	Thr	Phe	Ile	Glu	Glu	
	40					45					50					
atc	ctt	ctg	acg	gac	tac	aag	aag	aac	gtc	aat	ccg	acg	gta	aac	gtg	4537
Ile	Leu	Leu	Thr	Asp	Tyr	Lys	Lys	Asn	Val	Asn	Pro	Thr	Val	Asn	Val	
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Glu	Asp	Arg	Ala	Gly	Tyr	Trp	Trp	Ile	Lys	Ala	Asn	Gly	Lys	Ile	Glu	
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gtc	gat	tgc	gac	gag	att	tcc	gag	ctg	ttg	ggg	cgg	cag	ttc	aac	gtc	4633
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Lys	Leu	Glu	Asp	Tyr	His	Ala			Met	Ala	Lys	Leu	Gly			
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Ile	His	Ser	Asn	Asp	Thr	Arg	Asp	Ala	Trp	Val	Asn	Lys	Ile	Ala	Gln	
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Leu	Asn	Thr	Leu	Glu	Lys	Ala	Ala	Glu	Met	Leu	Lys	Gln	Phe	Arg	Met	
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gac	cac	acc	acg	ccg	ttc	cgc	aac	agc	tac	gaa	ctg	gac	aac	gac	tac	4922
Asp	His	Thr	Thr	Pro	Phe	Arg	Asn	Ser	Tyr	Glu	Leu	Asp	Asn	Asp	Tyr	
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ctc	tgg	atc	gag	gcc	aag	ctc	gaa	gag	aag	gtc	gcc	gtc	ctc	aag	gca	4970

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Leu	Trp	Ile	Glu	Ala	Lys	Leu	Glu	Glu	Lys	Val	Ala	Val	Leu	Lys	Ala		
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cgc	gcc	ttc	aac	gag	gtg	gac	ttc	cgt	cat	aag	acc	gct	ttc	ggc	gag	5018	
Arg	Ala	Phe	Asn	Glu	Val	Asp	Phe	Arg	His	Lys	Thr	Ala	Phe	Gly	Glu		
70					75					80					85		
gat	gcc	aag	tcc	gtt	ctg	gac	ggc	acc	gtc	gcg	aag	atg	aac	gcg	gcc	5066	
Asp	Ala	Lys	Ser	Val	Leu	Asp	Gly	Thr	Val	Ala	Lys	Met	Asn	Ala	Ala		
				90					95					100			
aag	gac	aag	tgg	gag	gcg	gag	aag	atc	cat	atc	ggt	ttc	cgc	cag	gcc	5114	
Lys	Asp	Lys	Trp	Glu	Ala	Glu	Lys	Ile	His	Ile	Gly	Phe	Arg	Gln	Ala		
			105					110					115				
tac	aag	ccg	ccg	atc	atg	ccg	gtg	aac	tat	ttc	ctg	gac	ggc	gag	cgt	5162	
Tyr	Lys	Pro	Pro	Ile	Met	Pro	Val	Asn	Tyr	Phe	Leu	Asp	Gly	Glu	Arg		
			120				125					130					
cag	ttg	ggg	acc	cgg	ctg	atg	gaa	ctg	cgc	aac	ctc	aac	tac	tac	gac	5210	
Gln	Leu	Gly	Thr	Arg	Leu	Met	Glu	Leu	Arg	Asn	Leu	Asn	Tyr	Tyr	Asp		
	135					140					145						
acg	ccg	ctg	gaa	gaa	ctg	cgc	aaa	cag	cgc	ggt	gtg	cgg	gtg	gtg	cat	5258	
Thr	Pro	Leu	Glu	Glu	Leu	Arg	Lys	Gln	Arg	Gly	Val	Arg	Val	Val	His		
150					155					160					165		
ctg	cag	tcg	ccg	cac	tga	agggaggaag	tctcgcctg	gacgcgacgg								5306	
Leu	Gln	Ser	Pro	His													
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catcgcctgtg	aagtcagg	ggcagg	gatg	ccgttccgg	ccggcagg	ct ggcccgaat										5366	
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tcacc	atg	gtc	gaa	tcg	gca	ttt	cag	cca	ttt	tcg	ggc	gac	gca	gac	gaa	5476	
	Met	Val	Glu	Ser	Ala	Phe	Gln	Pro	Phe	Ser	Gly	Asp	Ala	Asp	Glu		
	1				5				10					15			
tgg	ttc	gag	gaa	cca	cgg	ccc	cag	gcc	ggt	ttc	ttc	cct	tcc	gcg	gac	5524	
Trp	Phe	Glu	Glu	Pro	Arg	Pro	Gln	Ala	Gly	Phe	Phe	Pro	Ser	Ala	Asp		
				20					25					30			
tgg	cat	ctg	ctc	aaa	cgg	gac	gag	acc	tac	gca	gcc	tat	gcc	aag	gat	5572	
Trp	His	Leu	Leu	Lys	Arg	Asp	Glu	Thr	Tyr	Ala	Ala	Tyr	Ala	Lys	Asp		
				35					40					45			
ctc	gat	ttc	atg	tgg	cgg	tgg	gtc	atc	gtc	cgg	gaa	gaa	agg	atc	gtc	5620	
Leu	Asp	Phe	Met	Trp	Arg	Trp	Val	Ile	Val	Arg	Glu	Glu	Arg	Ile	Val		
				50			55					60					
cag	gag	ggt	tgc	tcg	atc	agc	ctg	gag	tcg	tcg	atc	cgc	gcc	gtg	acg	5668	
Gln	Glu	Gly	Cys	Ser	Ile	Ser	Leu	Glu	Ser	Ser	Ile	Arg	Ala	Val	Thr		
	65				70						75						
cac	gta	ctg	aat	tat	ttt	ggt	atg	acc	gaa	caa	cgc	gcc	ccg	gca	gag	5716	
His	Val	Leu	Asn	Tyr	Phe	Gly	Met	Thr	Glu	Gln	Arg	Ala	Pro	Ala	Glu		
	80				85				90					95			
gac	cgg	acc	ggc	gga	gtt	caa	cat	tga	acaggtaagt	tt	atg	cag	cga	gtt		5767	
Asp	Arg	Thr	Gly	Gly	Val	Gln	His					Met	Gln	Arg	Val		
				100								1					
cac	act	atc	acg	gcg	gtg	acg	gag	gat	ggc	gaa	tcg	ctc	cgc	ttc	gaa	5815	
His	Thr	Ile	Thr	Ala	Val	Thr	Glu	Asp	Gly	Glu	Ser	Leu	Arg	Phe	Glu		
	5				10				15					20			
tgc	cgt	tcg	gac	gag	gac	gtc	atc	acc	gcc	gcc	ctg	cgc	cag	aac	atc	5863	
Cys	Arg	Ser	Asp	Glu	Asp	Val	Ile	Thr	Ala	Ala	Leu	Arg	Gln	Asn	Ile		
				25					30					35			
ttt	ctg	atg	tcg	tcc	tgc	cgg	gag	ggc	ggc	tgt	gcg	acc	tgc	aag	gcc	5911	
Phe	Leu	Met	Ser	Ser	Cys	Arg	Glu	Gly	Gly	Cys	Ala	Thr	Cys	Lys	Ala		
			40					45					50				

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ttg	tgc	agc	gaa	ggg	gac	tac	gac	ctc	aag	ggc	tgc	agc	gtt	cag	gcg	5959
Leu	Cys	Ser	Glu	Gly	Asp	Tyr	Asp	Leu	Lys	Gly	Cys	Ser	Val	Gln	Ala	
		55					60					65				
ctg	ccg	ccg	gaa	gag	gag	gag	gaa	ggg	ttg	gtg	ttg	ttg	tgc	cgg	acc	6007
Leu	Pro	Pro	Glu	Glu	Glu	Glu	Glu	Gly	Leu	Val	Leu	Leu	Cys	Arg	Thr	
	70					75					80					
tac	ccg	aag	acc	gac	ctg	gaa	atc	gaa	ctg	ccc	tat	acc	cat	tgc	cgc	6055
Tyr	Pro	Lys	Thr	Asp	Leu	Glu	Ile	Glu	Leu	Pro	Tyr	Thr	His	Cys	Arg	100
	85				90					95						
atc	agt	ttt	ggt	gag	gtc	ggc	agt	ttc	gag	gcg	gag	gtc	gtc	ggc	ctc	6103
Ile	Ser	Phe	Gly	Glu	Val	Gly	Ser	Phe	Glu	Ala	Glu	Val	Val	Gly	Leu	
			105						110					115		
aac	tgg	gtt	tgc	agc	aac	acc	gtc	cag	ttt	ctt	ttg	cag	aag	cgg	ccc	6151
Asn	Trp	Val	Ser	Ser	Asn	Thr	Val	Gln	Phe	Leu	Leu	Gln	Lys	Arg	Pro	
			120					125					130			
gac	gag	tgc	ggc	aac	cgt	ggc	gtg	aaa	ttc	gaa	ccc	ggt	cag	ttc	atg	6199
Asp	Glu	Cys	Gly	Asn	Arg	Gly	Val	Lys	Phe	Glu	Pro	Gly	Gln	Phe	Met	
		135				140						145				
gac	ctg	acc	atc	ccc	ggc	acc	gat	gtc	tcc	cgc	tcc	tac	tgc	ccg	gcg	6247
Asp	Leu	Thr	Ile	Pro	Gly	Thr	Asp	Val	Ser	Arg	Ser	Tyr	Ser	Pro	Ala	
	150				155						160					
aac	ctt	cct	aat	ccc	gaa	ggc	cgc	ctg	gag	ttc	ctg	atc	cgc	gtg	tta	6295
Asn	Leu	Pro	Asn	Pro	Glu	Gly	Arg	Leu	Glu	Phe	Leu	Ile	Arg	Val	Leu	180
	165				170					175						
ccg	gag	gga	cgg	ttt	tgc	gac	tac	ctg	cgc	aat	gac	gcg	cgt	gtc	gga	6343
Pro	Glu	Gly	Arg	Phe	Ser	Asp	Tyr	Leu	Arg	Asn	Asp	Ala	Arg	Val	Gly	
			185						190					195		
cag	gtc	ctc	tgc	gtc	aaa	ggg	cca	ctg	ggc	gtg	ttc	ggt	ctc	aag	gag	6391
Gln	Val	Leu	Ser	Val	Lys	Gly	Pro	Leu	Gly	Val	Phe	Gly	Leu	Lys	Glu	
			200					205					210			
cgg	ggc	atg	gcg	ccg	cgc	tat	ttc	gtg	gcc	ggc	ggc	acc	ggg	ttg	gcg	6439
Arg	Gly	Met	Ala	Pro	Arg	Tyr	Phe	Val	Ala	Gly	Gly	Thr	Gly	Leu	Ala	
		215					220					225				
ccg	gtg	gtc	tgc	atg	gtg	cgg	cag	atg	cag	gag	tgg	acc	gcg	ccg	aac	6487
Pro	Val	Val	Ser	Met	Val	Arg	Gln	Met	Gln	Glu	Trp	Thr	Ala	Pro	Asn	
	230				235						240					
gag	acc	cgc	atc	tat	ttc	ggt	gtg	aac	acc	gag	ccg	gaa	ttg	ttc	tac	6535
Glu	Thr	Arg	Ile	Tyr	Phe	Gly	Val	Asn	Thr	Glu	Pro	Glu	Leu	Phe	Tyr	260
	245				250					255						
atc	gac	gag	ctc	aaa	tcc	ctg	gaa	cga	tcg	atg	cgc	aat	ctc	acc	gtg	6583
Ile	Asp	Glu	Leu	Lys	Ser	Leu	Glu	Arg	Ser	Met	Arg	Asn	Leu	Thr	Val	
			265						270					275		
aag	gcc	tgt	gtc	tgg	cac	ccg	agc	ggg	gac	tgg	gaa	ggc	gag	cag	ggc	6631
Lys	Ala	Cys	Val	Trp	His	Pro	Ser	Gly	Asp	Trp	Glu	Gly	Glu	Gln	Gly	
			280					285					290			
tcg	ccc	atc	gat	gcg	ttg	cgg	gaa	gac	ctg	gag	tcc	tcc	gac	gcc	aac	6679
Ser	Pro	Ile	Asp	Ala	Leu	Arg	Glu	Asp	Leu	Glu	Ser	Ser	Asp	Ala	Asn	
		295					300					305				
ccg	gac	att	tat	ttg	tgc	ggt	ccg	ccg	ggc	atg	atc	gat	gcc	gcc	tgc	6727
Pro	Asp	Ile	Tyr	Leu	Cys	Gly	Pro	Pro	Gly	Met	Ile	Asp	Ala	Ala	Cys	
	310					315					320					
gag	ctg	gta	cgc	agc	cgc	ggt	atc	ccc	ggc	gaa	cag	gtc	ttc	ttc	gaa	6775
Glu	Leu	Val	Arg	Ser	Arg	Gly	Ile	Pro	Gly	Glu	Gln	Val	Phe	Phe	Glu	340
	325				330				335							
aaa	ttc	ctg	ccg	tcc	ggg	gcg	gcc	tga	acc	ggg	gaag	tacc	gtg	acc		6822

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Lys Phe Leu Pro Ser Gly Ala Ala
345

accgagcagt	tcccgcccca	attcctgcgt	gaaatgatcg	agcagctgga	cgccagcatc	6882
caggagctcg	cacgcaagga	aaagggactt	gcggcatccc	tgggcacggg	ccgggtcgcc	6942
gagctcaagg	aatactggga	ccacgttctc	actcccagag	aggaatggga	gctcaagcga	7002
ccatggactt	ccgcgaccgg	gaactggtgt	ggatctggtc	ccgtctcagg	cgggcccga	7062
cctcccgcgc	caatgccggg	gaggcctata	tcgccagctg	tcgccggcgc	cgcgaaaaaa	7122
cgaacaatcc	tgaaacggag	tcgacgggta	tcgttgggaa	aaagggtatc	tgtcgccta	7182
ttttgt						7188